

crystallizations, and thready lines of a gold-like metal. The finest specimens are brought from China, Persia, and Great Bucharie. It is much esteemed for ornamental purposes, especially for pillars and inland work. The most superb exhibition of this rare substance is made in the celebrated marble palace built by Catherine, at St. Petersburg, for her favourite, Orloff, in which there are entire apartments inlaid with lapis lazuli. The great expense prevents it from being used to any extent in Great Britain, where, however, it is occasionally well imitated on wood by decorative painters. It is employed in forming the valuable pigment called *ultra-marine*.

Freestone, or, more properly, *sandstone*, consists of particles of sand, or silica, united by a natural cement and great pressure. It varies in colour from dingy red to yellow and greyish-white. The most esteemed for building is the yellow or white kind, and particularly that which possesses no tinge of iron. The best varieties are hard, but easily wrought by hammers and chisels, and are so close in texture as not to scale off or moulder through the influence of the weather. Those kinds which are inclined to softness should, after building, be smeared with a light varnish of oil, to fill the pores and prevent the encroachments of damp. The thinnest possible pellicle of white oil paint will be found to render sandstone indestructible by weather. Freestone is largely employed in Great Britain for fronts to public edifices and churches, but is not much employed in domestic architecture. The chief towns built of it are Bath, Edinburgh, and Glasgow. Near Edinburgh, and also in Fife, there are large quarries of this useful stone, suitable either for architecture or sculpture.

Trap.—The variety of this class of rocks, usually called *greenstone*, and in Scotland *schist*, is largely used in some places for house-building. It is a hard bluish substance, which breaks easily into square lumps, but is too brittle for polishing like sandstone. Quartz, felspar, and hornblende form a variety of trap called *gneiss*. All varieties of trap make excellent materials for macadamizing roads. *Chambers's Journal*.

NEW PROCESS FOR MANUFACTURING LIME, &c.

A PATENT has been granted to William Edward Newton, of Chancery-lane, for "improvements in manufacturing lime, cement, artificial stone, and such other compositions, more particularly applicable to working under water, and in constructing buildings and other works which are exposed to damp." (A communication.)—Sealed the 3rd of April, 1841.

This invention consists, firstly—in the formation, by certain new processes, of a hydraulic lime and cement, which has the property of becoming hard and solid, when under water, or exposed in damp situations. Secondly—in the application of the same principles to the hardening of soft stones, for the purpose of making hard artificial stones. Thirdly—in the employment of the same process for hardening wood, and preserving iron from the effects of damp, &c.

The following is the principle upon which the invention is founded, and the methods employed for carrying it into effect: the property which certain sorts of lime possess of being hydraulic, or hardening under water, is caused by a certain combination of the lime with silica, alumina, and sometimes also with oxide of manganese, and oxide of iron. The object, then, of this invention, is to facilitate the combination of the lime with those oxides, by means of agents not hitherto employed. Thus, in operating by the dry method, as is generally the case, instead of calcining the limestone or lime with sand and clay, the inventor, in order to facilitate the combination of the silica and alumina with the lime, introduces a small quantity of potash or soda, in the state of carbonate, sulphate, or chloride, or of any other salt of these bases, susceptible of decomposition, or becoming a silicate, when such calcination takes place. The salt of potash or soda, the quantity of which varies from three to six per cent. to the quantity of lime, is employed in the state of solution, so as to penetrate and mix better with the alkaline salt in the chalk or slacked lime. Calcination effects the rest in the ordinary manner.

In order to combine or incorporate more equally, by the dry method, the alumina, and the oxides of manganese and of iron, with the lime, the sulphates of these bases are first decomposed by the slacked lime, by making a paste with a solution of the sulphates, mixed with the lime. This paste, into which the sulphates in question enter, in the proportion of from six to ten per cent. of the lime, is then calcined, in order to produce a hydraulic lime. All sorts of lime are made hydraulic, by the humid method, by mixing slacked lime with solutions of alum or sulphates of alumina; but the best method consists in employing a solution of the silicates of potash, or of soda, called liquor of flints or soluble glass. A hydraulic cement may also be made, which will serve for the manufacture of architectural ornaments, by making a paste of pulverized chalk, and a solution of the silicate of potash, or of soda; in working with this plaster, it becomes much harder than ordinary plaster.

These same silicates of potash or soda, dissolved in water, will also harden chalk or soft and porous stones, and transform them, artificially, into hard stones. In order to do this, these soft stones, either rough or cut into their proper forms, must be soaked in a solution of the silicate, either warm or cold, and allowed to remain there a longer or shorter time, according to the degree of hardness which it may be necessary to give them; after which they must be taken out and left exposed to the air. At the end of a few days, stones, thus prepared, will have acquired a hardness equal to that of marble; and this quality in a little time pervades the whole mass; for if, for the purpose of polishing, the outer coat or surface be removed, the inner one, which at first is not so hard, will harden, in its turn, by exposure to the air. This takes place as far as the silicate has been able to penetrate. A more superficial hardness is obtained, by applying the solution of the silicate of potash or soda, by means of a brush. It is in this manner that walls constructed of chalk and mortar may be hardened. Sculpture, and various other objects which may be made or prepared in chalk, may be hardened, and afterwards serve for decorating buildings and other purposes, without the fear of their becoming injured by frost or damp. Chalk, hardened in this manner, may also be used as a substitute for the stones now employed by lithographers. Plaster models may also be hardened, by placing them, for some time, in a solution of the silicate; but it would be still better to add a portion of the solution to the paste, at the time of making the model, or using the plaster. The silicate of potash or soda is prepared by fusing one part of white siliceous matter with from one and a half to two parts of potash or soda, in the ordinary reverberatory furnace, or in a glass-maker's or iron crucible. The solutions may be used of any density for plaster; but they should be weaker for chalk. In the last place, the inventor has found that the silicates of potash or soda, when dissolved in water, decompose spontaneously in the air, and cover the objects to which their solution has been applied with a strong covering or layer; therefore, by applying the solution of silicate of potash, or of soda, to polished iron, and allowing it to dry in the air, the metal is preserved from oxidation. By soaking wood many times in this solution, and allowing it to dry in the open air every time after it has been placed therein, it becomes so much penetrated with silica, that it acquires a considerable density and degree of indestructibility.

The solution of the silicate of potash is not the only substance which, on being injected into porous bodies, tends to harden them. A mixture, made from a solution of bicarbonate of ammonia, and of chloride of magnesium, may be successfully employed; or a mixture of the solutions of ammoniac and chloride of calcium may be used. In these latter cases, instead of having ammoniac injections, they are either magnesium or calcium. Soft and porous stones may also be considerably hardened, and defended from the action of damp, by first well drying them, and then dipping or steeping them in sulphur; or some natural or artificial resinous or luminous substance, rendered liquid by heat.

The patentee claims, firstly—the application of certain new means to change or convert all descriptions of lime into hydraulic limes

and cement, or such as become hard under water, or when exposed in damp situations, by combining these limes and cements with silica, alumina, the oxide of manganese, or the oxide of iron, either by the dry or humid method. Secondly—the manufacture of hard artificial stones from chalk, plaster, and all porous stones in general, by injecting into them, or imbedding them with silica, or the carbonates of magnesia or lime, by any of the above-described processes; or by soaking them, by virtue of their porous nature, in absorbent melted sulphur, or bituminous, resinous, or fatty matters, properly liquified by means of heat. Thirdly—in the employment of the silicates of potash or soda, for making or forming a stony plaster or coating upon a variety of substances; thereby preventing iron from becoming rusty or oxidized, and rendering wood and other organic matters harder, and not liable to decay. (Enrolled in the Petty Bag Office, September, 1841.)—*London Journal*.

CHURCH BUILDING ACT.

ON the 22nd ult., a meeting of the Society for Erecting and Enlarging Churches, &c., was held at their chambers, in St. Martin's-place, Trafalgar-square. The Lord Bishop of Landaff was chairman, and there also were present the Bishops of Ely and Chichester, the Dean of Chichester, Archbishop Haile, Revs. Dr. Spry, Dr. D'Oyley, and Benjamin Harrison; N. Connop, jun., J. S. Salt, J. W. Bowden, H. J. Barchard, G. Freer, E. Pavell, T. H. Dickinson, M. P., James Cocks, S. B. Brooks, Esq., &c. The Secretary having read the report from the sub-committee, the meeting proceeded to investigate the numerous cases referred to them, and granted votes of various sums for the following purposes:—Towards building a church at Nutley, in the parish of Maresfield, Sussex; rebuilding the church at Hurn Pierpoint, Essex; towards rebuilding the church at Llandinor, Carmarthenshire; building a church of Wokington, in the parish of Ripon, Yorkshire; rebuilding the church at Newton Toney, Wiltshire; enlarging and repairing the church at St. Mary, at Marlborough, Wiltshire; enlarging and repairing the church at Binsted, Hampshire; rebuilding the church at All Saints, Dorchester; building a church at Little Milton, Oxfordshire; rebuilding the chapel at Elliker, Yorkshire; repairing the church at Bawdsey, Suffolk; and building churches at Ashby-road and Montpellier, in the parish of St. Paul, Bristol. Certificates of the completion of the erection, enlargement, and repairing of churches and chapels in five parishes, were examined and approved, and warrants were issued to the treasurer to disburse the amount awarded in each case. After some further details of less importance had been disposed of, the society adjourned to its annual general meeting.

FALLING OF HOUSES.

About four o'clock on Sunday morning, the whole of the back part of the houses Nos 15 and 16, Summer-street, Back-hill, near Hatton-garden, fell with a most terrific crash. At the time of the accident there were no less than two families in the house (No. 15), making in all a total of 15 individuals, all of whom most providentially escaped. A poor woman, named Parker, who rented the parlours of No. 15, happened to be attending to a sick child, and was just in time to snatch her eldest son, a youth of about 12 years of age, from his bed, when the whole of the superincumbent weight fell on. The police were immediately upon the spot, and rendered every assistance. A young woman, named Harris, had a very narrow escape—she was precipitated from the second floor to the basement story, and was rescued by one of the G division, only slightly bruised. The case of the poor woman Parker seems to be peculiarly hard. Not long since a child of hers was burnt to death, and since that period her husband was killed by the falling of some timber in the mabogany-yard of Mr. C. Swin, of Back-hill. The poor woman's goods have been nearly all destroyed, and her wretchedness, which has long endeavoured to support her family, now lies buried among the ruins. The estate has long been in a disgracefully dilapidated condition. It belongs to the relict of the late Captain Burton, R.N. It was the opinion of the neighbourhood last evening, that if the wind at all freshened from the quarter in which it is at present, the whole row of houses would come down before the morning. The inhabitants all moved away during yesterday, and, perhaps, a more providential escape was never upon record.

NEWSPICURE.—The ceremony of laying the first stone of a new church at Larkham, in this city, took place on the 25th ult.